

Lesson Plan Template

Instructions: This lesson plan template provides a space for you to plan lessons around the Education Connections model of Sheltered Instruction (SI), which includes four strands—*define, modify, cultivate, apply*. (See page 4 of this document for more information on the four strands). Fill out the information about your lesson plan in the space provided in the left-hand column, *Lesson Information and Activities*. While you plan, list which strand(s) relates to this portion of your planning in the right-hand column, *SI Strand(s)*, along with any notes about how the strand can be implemented effectively in this lesson.

Lesson Information and Activities							SI Strand(s)														
<p>Lesson Title: Famous Scientists in Atomic Theory</p> <p>Content Area: Chemistry Grade Level(s): High School (10/11)</p> <p>Unit Description: In this lesson, students will read about famous scientists in the area of Chemistry and apply their knowledge to what they have learned by writing a procedural essay on the scientist and his/her contribution.</p> <hr/> <p>Length of lesson: One 90-minute class period Number of ELs: 15+</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;">Proficiency Levels</th> <th style="width: 12.5%;"></th> <th style="width: 12.5%;"></th> <th style="width: 12.5%;">Developing</th> <th style="width: 12.5%;">Expanding</th> <th style="width: 12.5%;">Bridging</th> <th style="width: 12.5%;">Reaching</th> </tr> </thead> <tbody> <tr> <td>ELs (numbers and/or names)</td> <td></td> <td></td> <td>3</td> <td>7</td> <td>5</td> <td></td> </tr> </tbody> </table> <p>Program Model: Newcomer Sheltered Science</p> <p>Other relevant student information: This lesson is developed for a Newcomer Sheltered Science class (Chemistry) but could also be adapted for a mainstream Chemistry class.</p>							Proficiency Levels			Developing	Expanding	Bridging	Reaching	ELs (numbers and/or names)			3	7	5		Define
Proficiency Levels			Developing	Expanding	Bridging	Reaching															
ELs (numbers and/or names)			3	7	5																
<u>Standards and Objectives</u>							Define														

Lesson Plan Template

Lesson Information and Activities			SI Strand(s)
	Language Objectives	English language proficiency standards	Define
1	Students will read about famous scientists, listen to each other read, orally discuss the scientific contributions of the scientists, and write an essay with procedural words such as first, second, next, etc.	<p>WIDA (from Key Uses) <i>e.g., bridging level:</i></p> <ul style="list-style-type: none"> • Identifying details from oral discussions (e.g., when, who, where, what, and why) • Presenting factual information on content-related topics to the class • Paraphrasing and summarizing content-related ideas in large and small group • Creating narrative or informational extended text of past events or experiences (e.g., lab reports, current events) <p><i>e.g., developing level:</i></p> <ul style="list-style-type: none"> • Choosing words and phrases to provide precise details, descriptions, comparisons, and ordered procedures (9-12 Key Uses document found at https://www.wida.us) 	
	Content Objectives	Content Standards	
1	Students will learn historical information about famous scientists in the field of chemistry and be able to understand their contributions as related to atoms and their components.	<p>Next Generation Science Standards: HS.PS1.A: Structure and Properties of Matter The structure and interactions of matter at the bulk scale are determined by electrical forces within and between atoms. (HSPS26) NGSS Appendices H & J are applicable as they reflect contributions of scientists. See here: https://www.nextgenscience.org/resources/ngss-appendices</p>	

Lesson Plan Template

Lesson Information and Activities			SI Strand(s)
2		<p><i>Common Core State Standards Connections:</i></p> <p><i>ELA/Literacy -</i></p> <p><u>RST.11-12.1</u> Cite specific textual evidence to support analysis of science and technical texts and related issues/claims by identifying important distinctions the author makes and to any gaps or inconsistencies in the account. (HS-PS1-5)</p> <p><u>WHST.9-12.2</u> Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-PS1-2),(HS-PS1-5)</p> <p><u>WHST.9-12.5</u> Develop and strengthen writing as needed by planning, revising, editing, trying a new approach, focusing on addressing what is most significant and trying to meet the needs and purposes of the task. (HS-PS1-2)</p>	

Lesson Plan Template

Incorporating all four language domains

Identify how the language demands of the tasks are related to each language domain.

	Written	Oral
Receptive	<p><i>Reading</i></p> <p>Students will read about a specific scientist they are assigned on a website called https://www.famousscientists.org.</p>	<p><i>Listening</i></p> <p>Students will listen to each other read and discuss their scientist's contribution.</p>
Productive	<p><i>Writing</i></p> <p>Students will collaboratively write an essay that details a particular scientist's contribution to the field of chemistry using procedural words.</p>	<p><i>Speaking</i></p> <p>Students will work in small groups at their tables to determine the plan for writing, and cite evidence from the online text.</p>

Define

Key language for students (words and phrases, grammatical structures, sentence types, structure and amount of speech/text, organization of ideas, genre, etc.)

General academic language	Language specific to the content area
First, second, third, fourth, afterwards, next, then, following that, last, finally	Atom, (positive) proton, neutron, electron, nucleus, Bohr model, mass, waves, gold foil, plum pudding, fixed orbitals, particles

Define

Key characteristics of teacher talk (ways to make the content comprehensible for all students, ways to model key language, etc.)

Group students according to reading level. Draw pictures to illustrate the main concepts of the article (specifically the scientific concept associated with each scientist, i.e. Bohr and Bohr model; Thompson and plum pudding, etc.).

How the lesson will incorporate bilingualism/students' native languages as resources

Consider grouping students based on common home languages. Students may discuss the article using their home languages.

Materials and Texts

Modify

Lesson Plan Template

Name	Genre (e.g., narrative)	Level	Connection to Students (What will this mean to them? How can you make it even more meaningful?)
Atomic Chemists	Nonfiction	High School, WIDA bridging level and up	I can relate the scientist's contribution to the concepts the students have learned in class so far. Students can associate their knowledge of the country from which each scientist comes and make connections.

Supplementary Materials and Realia

Students will have computers to access the assigned scientist's text. They will also have access to lists on the board of procedural words as well as a rubric of the writing so they will know what they need to include in the final writing product.

The website has pictures of each scientist as well as information about them: <https://www.famousscientists.org/top-chemists/>

Lesson Plan Template

Lesson Information and Activities	SI Strand(s)
<p>Estimated Time: One 90- minute class period</p> <p>Language Domains: X Reading X Writing X Listening X Speaking</p> <p>Grouping: X Independent Work X Pair X Small Group X Whole class</p> <p>Reason for grouping: X First language X English proficiency X Reading level X Content understanding <input type="checkbox"/> Interest <input type="checkbox"/> Other:</p> <p>Preview: Connections to past learning or the larger unit sequence.</p> <p>Presentation: Primary activity steps associated with lesson implementation Differentiation, scaffolding, modifications, strategies employed, interaction activities, materials integrated that function to shelter language and content for the EL students.</p> <p>Students will read information on scientists who have made a significant contribution to chemistry and specifically as related to atoms, their constituent parts, and the study of them. Then the students will write a procedural essay in small groups.</p> <ol style="list-style-type: none"> 1. As a whole group, the teacher will review with the students the important procedural words and use them in examples. Such examples can include a review of a scientist they have studied and listing his/her accomplishments, then putting the list together in a narrative format on the board for all to see. Procedural words such as first, second, third, last, next, afterwards, etc. will be on a visual for students to see and refer back to. 2. Then, the teacher will group students purposefully and heterogeneously by language background and English Language development levels in small groups of 2 or 3 (e.g., WIDA https://www.wida.us/standards/eld.aspx) 3. In each group, students will be assigned a specific scientist who has made a significant contribution to chemistry as related to the study of atomic theory. These include the following: <ol style="list-style-type: none"> a. Democritus (first postulated that matter is composed of ‘atomos’) b. John Dalton (formulated atomic theory) c. J. J. Thompson (came up with ‘plum pudding’ model and determined electrons) 	<p>Define/Modify</p>

Lesson Plan Template

Lesson Information and Activities	SI Strand(s)
<p>Assessment: Activities for formative and summative assessment during and after primary lesson activities. How does assessment account for the language demands embedded in core content for ELs?</p> <p>Assessment will occur on both a formative and summative basis. First, students will work in groups and develop the sentences using procedural words based on the bolded terms in 6 (above)(i.e. content, grammar, procedural terms, and number of sentences). The students will be each other's checks and balances to correct and revise each other's products. Some sentences will be more challenging than others and heterogeneous groups will support the collective product. Students will check each other's procedural essays using the rubric and will ensure that the key components are included. They will work in groups to assess each other's essays and then share out as a whole group, with the teacher's support. The teacher will use the rubric to check that all language demands and core content are appropriately addressed and assess the students' work as a summative assessment.</p>	
<p>How are parents, families, and the community invited into or associated with the content, delivery, or extension of this lesson?</p> <p>Families and communities are invited into the content as the teacher will ask each student in the presentation phase of the lesson if they know any famous chemists that speak the student's home language. As an extension, students can ask their families in their home languages how (and if) the parents or grandparents learned about these scientists previously. Prompts can include (in the home language):</p> <p>What do you know about that scientist?</p> <p>Explain what his/her contributions were?</p> <p>How was this scientist viewed (in your school/in your country)?</p> <p>How do you say... (nucleus, proton, electron, atom, etc.) in xx language?</p> <p>Another extension activity would be to have parents recount the contributions of this famous chemist (that was not discussed in class) in the home language to the student and have the student write the narrative in English using procedural words.</p>	Cultivate

Lesson Plan Template

Four Strands of Sheltered Instruction

Sheltered Instruction is an approach that makes academic content, as well as language development, more accessible for EL students. The Education Connections activities are based on **Four Strands** of Sheltered Instruction. They are: Define, Modify, Cultivate, Apply.

Define

- Develop, define, refine, communicate, and assess *content objectives* for every lesson
- Develop, define, refine, communicate, and assess *language objectives* for every lesson
- Ensure objectives derive from, and are aligned with, English language proficiency (ELP), as well as content standards

Modify

- Differentiate instruction through lesson adaptation and instructional modifications
- Scaffold instruction in response to students' individualized language and content learning needs
- Identify the language demands and domains embedded in lessons and explicitly address language use and needs for both teaching and learning

Cultivate

- Explicitly identify and acknowledge the cultural competence, human capital, knowledge, experiences, and resources students bring to the classroom
- Invite parental and/or familial involvement in the school and classroom and make connections that extend beyond the core curriculum
- Support native language maintenance, additive bilingualism, and biliteracy development

Apply

- Directly promote language use through interaction with peers, teachers, as well as the core content
- Encourage and facilitate language use in both English, as well as students' home languages
- Develop and implement activities that require use of all four language domains